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TITLE: System and method for customer recognition using wireless identification and visual data transmission

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The customer ID number identifies and corresponds to a customer data record contained in a database hosted in an establishment's network server or host platform computer. The customer record includes the customer name and related customer information, such as the customer's transactional history, personal profile information including purchase preferences, an accumulated loyalty or incentive point total, and the like. The related customer information is retrieved from the database using the customer ID as an identification key. The customer's name, related customer information and the customer's videographic image are bundled into a customer record and transmitted for display to in-store terminals in order that the establishment's staff is able to identify each customer by their photograph, without the customer having to announce themselves or otherwise affirmatively advertise their presence.

In one aspect of the invention, the customer ID card is a wireless ID card or ID tag that comprises a memory store which includes at least a customer ID and may include related customer information such as the customer's name, transactional history information, profile information, and accumulated loyalty or incentive point totals. The commercial establishment includes entrance gates provided with RF antenna and transceiver systems that are able to interrogate a customer ID card and, if valid, receive the customer ID and additional customer information contained therein. In response to receipt of a valid customer ID, each entrance gate further includes a videographic image collection means, such as a video camera, which captures videographic image of a customer as they enter the establishment. Customer data is bundled together with the customer videographic image and is further transmitted to in-store terminals coupled in a network configuration.

As a person or persons activates the sensor 16, the sensor processor 18 causes the control unit 20 to issue a signal to a video signal processor circuit 26, or the sensor processor 18 issues a signal directly to the video signal processor, in turn, causing a video camera 24 to make a videographic record of the face and upper body portion of the person or persons activating the sensor. The videocamera 24 is typically positioned in a fixed location, such that its lens image is framed to cover the area of the entrance/exit gate 12. The videocamera 24 is, thus, able to take videographic image of anyone in close physical proximity to the sensor 16. Videographic image data is processed by the video signal processor circuit 26 and is subsequently routed through the central control unit 20 to a computer network server 28 which, in a manner to be described in greater detail below, bundles the customer's videographic image with particular customer related data pertinent to the customer whose image has just been captured.

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If a customer is carrying an appropriate customer ID card (or ID tag) passes in proximity to the antenna 14, the customer ID card 10 transmits at least a unique customer identification number, which is received by the antenna 14 and directed, in turn, to the transmitter/receiver circuit 22. In the case where customer profile, preference and transactional history data is transmitted to the system by a customer's ID card 10, the control unit 20, or the network server 28 bundles this information together with the customer's videographic image data and provides the resulting customer recognition information and data set, as a complete record, to various types of sales and/or service assistance terminals disposed throughout the establishment. Such terminals might suitably comprise point-of-sale terminals 30 if the establishment is a retail facility, for example, or might include work stations 32 or mobile terminals 34 depending on the nature of the establishment and the particular needs of its staff. Regardless of the type of terminals provided, it is sufficient that each of such terminals have the ability to display videographic image data along with text information describing a customer's profile, preferences, demographic and transactional history data.

Returning briefly now to the entrance/exit gate 12, it will be understood that each customer's ID will be transmitted to the antenna 14 and received by the system, each time the customer passes through the entrance/exit gate 12, such as when the customer is leaving the establishment, as well as entering. The system according to the invention is able to differentiate the in/out sensor signals in order to determine whether a customer is entering or leaving by comparing the received customer ID signal to a list of already-received customer IDs. Once a particular customer enters the establishment for the first time, and transmits their unique customer ID, a record of each customer ID is maintained in either the central control unit 20 or in a memory location comprising the network server 28, connected to the central control unit. That customer ID is maintained in memory until such time as that particular customer decides to leave the establishment. Therefore, as each customer passes by the in/out sensors 16 comprising the entrance/exit gate 12, their customer ID number is received by the transmitter/receiver circuit 22 of the system. The received customer ID is compared to the contents of the customer ID table, or record, maintained in memory, to determine if the received customer ID matches any entry therein. If the received customer ID number matches an entry in the table, it is assumed that the corresponding customer has previously entered the store and, is, therefore, leaving. In response, that customer ID number is deleted from the customer ID table and that customer's videographic image (taken when that customer activated the in/out sensor 16) is deleted from the system.

It should also be noted, at this point, that the videographic image data taken by the video camera 24 might comprise either gray scale or color video data. Preferably, the videographic image data will be in color in order to adequately represent a customer's personal appearance, i.e., hair color, clothing color, and the like. Although the camera 24 is described as a video camera, it should be understood by those having skill in the art that the most typical implementation of the system according to the invention will comprise an apparatus to capture a still customer image rather than a full-motion video image. Accordingly, the camera 24 might comprise a digital still camera, a video camera or any other type of device that outputs a digital image.

As was described previously, the central control unit 20 functions to gather the customer ID information and videographic image data and forward this information to various in-store terminals. In response to a determination that a sensor signal is an IN signal, the central control unit 20 might combine the received customer ID and videographic image data and directly provide these to the various in-store terminal units. Information transmission may be made directly between the central control unit 20 and respective ones of the various in-store terminal units, but is preferably made through an intermediary network server system 28. Because of its utility as a network server, the server 28 is directly coupled to each of its client POS terminals 30, workstations 32 and other terminal systems which have direct hard-wire connections made to the network bus. In addition, the network server 28 is easily configured to host an RF transceiver circuit such that it is able to communicate with a multiplicity of wireless remote terminals 34. Thus, it will be seen that the network server 28 might function either as a communication and/or transmission nexus for the central control unit 20, or as the primary memory host and information processing and routing center.

A typical kiosk terminal 80 would comprise a card reader 82 which is configured to read a customer ID card 10 which might be implemented as a magnetic stripe card, a contact-type IC card, a contactless-type IC card or any other conventional form of ID card or ID tag that is able to be programmed with a customer identification number. As a customer enters an establishment, and accesses the check-in kiosk 80, the kiosk terminal might request the customer to insert or swipe their customer ID card through the card reader 82 in order to identify that customer by means of their ID. In the case where a particular customer has not been issued a customer ID card, or that customer is not a member or participant of that establishment's incentive or loyalty program, the kiosk informational display defaults to a general information program configured for a member of the general public. If the customer has been issued with an ID card, inserting or swiping the ID card through the card reader 82 activates a digital camera 84 which takes a videographic image of the customer and transmits the videographic image, along with the customer ID, to either a system control unit 86 or a store server 88. The control unit 86 or store server 88 uses the customer ID to access that customer's information record contained in a database and bundles that information along with the customer's videographic image for transmission to point-of-sale terminals, mobile terminals, establishment work stations, and the like, in the same manner as described in connection with FIG. 1.

Accordingly, there has been brought to the art of electronic shopping systems, a system and method that is able to allow particular customers to be recognized, using wireless identification and visual data transmission, without the need for those customers to announce themselves to an establishment's staff. Customers are identified in accordance with a customer ID which, in turn, corresponds to profile and transactional history information specific to that customer. An establishment's staff is able to affirmatively recognize a customer by examining a videographic image of that customer, which was automatically captured at the time the customer entered the establishment. A customer's videographic image is bundled with their personalized data and made available to a multiplicity of in-store terminals for access by the establishment's staff. It will be appreciated that an electronic shopping system in accordance with the various embodiments of the invention can be constructed in whole or in part either from special purpose-built hardware or

from general purpose computer system components which are controlled by a suitable application program. While the invention has been described with respect to particular illustrated embodiments, those skilled in the art and technology to which the invention pertains will have no difficulty devising variations which in no way depart from the invention. For example, while the illustrated embodiments have been described in connection with a store server system, coupled to a local network, it will be appreciated that a distributed set of network servers could be employed to like effect and utility without departing from the present invention. In addition, the communication link or links employed between a customer ID card an interrogation or kiosk system, and between the system and a store server, might be either wired or wireless. In this regard, wireless communication, whether between an interrogator and customer ID card, or between and among the various components of the system, might be infrared as well as RF. Accordingly, the present invention is not limited to the specific embodiments described above, but rather as defined by the scope of the appended claims.

9. The electronic shopping system according to claim 8, further comprising a multiplicity of in-store terminals, including a plurality of point-of-sale terminals, the multiplicity of in-house terminals coupled to the store server over a local-area-network configuration, the store server transmitting a customer specific data set to each of the in-house terminals connected to the server over the local-area-network configuration.

21. The customer recognition method according to claim 20, the method further comprising: providing a multiplicity of in-house terminals, including a first plurality of point-of-sale terminals and a second plurality of mobile terminals; coupling the multiplicity of in-house terminals to the store server over a local-area-network configuration; and transmitting a customer specific data set to each of the in-house terminals connected to the server over the local-area-network configuration upon that customer's entry into the retail facility.